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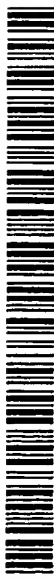


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(75) Inventors/Applicants (*for US only*): **ESPERESTER,** *For two-letter codes and other abbreviations, refer to the "Guid-*  
Anke [DE/DE]; Rosmerthastrasse 84, 55126 Mainz (DE). *ance Notes on Codes and Abbreviations" appearing at the begin-*  
**FREY, Hans, W. [DE/DE]; Helmerichstrasse 38, 55437** *ning of each regular issue of the PCT Gazette.*



**WO 01/28363 A1**

(54) Title: METHOD FOR TREATMENT OF CHRONIC VENOUS INSUFFICIENCIES USING AN EXTRACT OF RED VINE LEAVES

(57) Abstract: The invention relates to a dietary supplement consisting of an aqueous extract of red vine leaves and an acceptable carrier which prevents and reduces the discomfort relating to mild-to-moderate chronic venous insufficiency of the legs.

**Method for Treatment of Chronic Venous Insufficiencies using an Extract of Red Vine  
Leaves**

5

RELATED APPLICATION DATA

This application claims benefit to US Provisional Application serial no. 60/160,518 filed  
10 10/20/99.

TECHNICAL FIELD OF THE INVENTION

The present invention relates to a dietary supplement, and more particularly, to a dietary  
15 supplement for preventing or alleviating the discomfort associated with mild-to-moderate  
chronic venous insufficiency of the lower extremities.

BACKGROUND OF THE INVENTION

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Presently, there are millions of people around the world who suffer from mild-to-moderate  
chronic venous insufficiency of the legs. This common condition is characterised by an  
inadequacy of the venous circulation to return blood from the legs to the heart. The lack of  
adequate venous return results in venous stasis and an increased pressure within the venous  
25 circulation, promoting the development of oedema and tissular water retention.

Chronic venous insufficiency (CVI) is a functional disorder caused by persistent inadequacy  
of the venous return and is characterised clinically by oedema, skin changes and subjective  
complaints such as tired, heavy legs, pain or tingling sensations, which are typically amplified  
30 by standing upright and by high ambient temperatures. This dysfunction may be a source of  
major distress with a significant negative impact on the patient's overall well-being and  
quality of life. Early stages (grade I) are characterised by coronal phlebectasia paraplantaris,  
subfascial congestion and oedema; grade II CVI is associated with low-grade skin changes,

eczema and lipodermatosclerosis. If untreated, grades I and II often progress to an advanced stage characterised by recurrent venous leg ulcers (grade III). The distress caused by the symptoms, even when relatively mild initially, and the risk of later complications call for appropriate supportive and preventive measures to be initiated in the early stages of CVI.

5

Although some patients, even at early stages, might require surgery (sclerotherapy and variceal surgery), the use of compression stockings with or without additional physiotherapy is the most common treatment approach. The effect of compression is merely mechanical, i.e. this approach does not affect or correct the related biological dysfunction (capillary fragility in particular). Furthermore, the treatment with compression stockings often lacks compliance because of cosmetic concerns and the overall inconvenience of the compressive stockings, in the summer in particular. Therefore there is an urgent need for alternative approaches that are effective, well-tolerated and more convenient.

15

#### BRIEF DESCRIPTION OF THE INVENTION

20

Surprisingly, it has been found that an aqueous extract of red vine leaves can be used for the preparation of a dietary supplement for the prevention and treatment of the discomfort associated with mild-to-moderate chronic venous insufficiency of the lower extremities.

25

The present invention therefore relates to a method for preventing and/or alleviating the discomfort associated with mild-to-moderate chronic venous insufficiency of the lower extremities, which method comprises administering a dietary supplement containing an aqueous extract of red vine leaves.

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Another aspect of the present invention is a dietary supplement composition which comprises an active principle being capable of preventing and/or treating the discomfort associated with mild-to-moderate chronic venous insufficiency of the lower extremities and an pharmaceutically, cosmetically or dietetically acceptable carrier, the improvement wherein is that said active principle essentially consists of an aqueous extract of red vine leaves.

35

The dietary supplement composition of the present invention preferably consists of herbal ingredients derived by an aqueous extraction from red vine leaves (*folia vitis viniferae*;

Extractum Vitis viniferae e folium spissum et siccum) and an acceptable carrier. This extract contains flavon(ol)-glycosides, -glucuronides and flavonoids, with quercetin-3-O- $\beta$ -D-glucuronide and isoquercitrin (quercetin-3-O- $\beta$ -glucoside) as its main active ingredients. The range of their pharmacological actions has not yet been fully elucidated, but in-vitro studies indicate that they have antioxidant and anti-inflammatory properties and that they inhibit platelet aggregation and hyaluronidase and reduce oedema, possibly by reducing capillary permeability. Preclinical in-vivo experiments demonstrated anti-inflammatory and capillary wall thickening effects.

### DETAILED DESCRIPTION OF THE INVENTION

In a preferred embodiment, the dietary supplement is in a form suitable for oral administration, in particular in a solid dosage form, i.e. a capsule or tablet, that consists of 20 to 60% of aqueous red vine leaf extract with a high flavonoid content of 2-15%. Another preferred dosage form is that of drops containing 3 to 90% of extract. Further suitable administration forms may be coated tablets, syrups, or the like.

With the foregoing in mind, it is a primary object of the present invention to provide a dietary supplement for preventing and alleviating the discomfort associated with mild-to-moderate chronic venous insufficiency of the lower extremities.

It is a further object of the present invention to provide a dietary supplement for preventing and/or alleviating the discomfort associated with mild-to-moderate chronic venous insufficiency of the lower extremities comprising herbal ingredients, wherein the dietary supplement is manufactured pursuant to a controlled process that preserves the herbal curing qualities of the ingredients.

It is still a further object of the present invention to provide a dietary supplement which is effective in preventing and/or alleviating the discomfort associated with mild-to-moderate chronic venous insufficiency of the lower extremities.

It is still a further object of the present invention to provide a dietary supplement for preventing and/or alleviating the discomfort associated with mild-to-moderate chronic venous

insufficiency of the lower extremities comprising herbal ingredients and having minimal or no side effects and thus being safe for internal consumption.

5 A fundamental part of the present invention is the preparation of a supplement for oral administration containing an aqueous extract prepared from dried red vine leaves. The latter is characterised by a high content of 2 to 20%, preferably 2 to 10 % of biologically active flavonoids.

10 In order that this invention be more fully understood, the following examples are set forth. These examples are for the purpose of illustrating embodiments of this invention, and are not to be construed as limiting the scope of the invention in any way.

The examples which follow are illustrative and, as recognized by one skilled in the art, particular conditions could be modified as needed for individual compositions. Materials used  
15 in tests below are either commercially available or easily prepared from commercially available materials by those skilled in the art.

The basis of the supplement is the aqueous extract of red vine leaves (*foliae vitis viniferae* L.). The starting material for the preparation of the extract are red vine leaves collected at a point  
20 of time where the content in flavonoids has reached an optimum. This is usually the case around the harvesting time of the grapes. The leaves are carefully dried and crushed. For extraction the leaves are cut to pieces of preferably 5 to 10 mm. To achieve a high content in flavonoids the extraction is done at elevated temperature, preferably at a temperature in the range of 60° to 80°C, over a time of at least 6 up to 10 hours. The preferred method is that of  
25 an exhaustive percolation.

The so-called fluid extract obtained in the course of the extraction may be directly used in the preparation of liquid dosage forms. In order to get a more concentrated extract preferably at least part of the solvent is removed by use of a suitable evaporator. The thick extract obtained  
30 in this step may again be directly used in the manufacturing of liquid dosage forms.

For the preparation of solid dosage forms the thick extract is dried, for instance by use of a vacuum drying oven or a vacuum drying conveyer. Carriers or excipients may be added

during drying to facilitate further processing of the extract. Such carriers or excipients may be silicon dioxide, maltodextrine, glucose syrup, cellulose and others.

5 The supplement for oral administration is manufactured using usual techniques applied in the food industry or in the pharmaceutical industry. Preferred administration forms are tablets, including coated tablets or capsules. But also liquid preparations, preferably drops, may be chosen.

10 To prevent and/or alleviate the discomfort of mild-to-moderate chronic venous insufficiency of the lower extremities, the dietary supplement should be taken in dosages corresponding to 80 and 1000 mg of extract, preferably 300-800 mg, in particular 350-750 mg daily. The total amount of extract may be divided up in 1 to 3 capsules or tablets a day (or an equivalent dose by means of a liquid form). The daily dose should be taken at once, preferably in the morning.

15 Impressive improvement of the symptoms can be expected within 6 weeks of continuous use. The optimum effect is maintained or amplified on longer use.

20 In order to verify the effectiveness, safety and tolerability of the dietary supplement of the present invention, a randomised, placebo-controlled, double-blind parallel-group study was conducted in a large and representative sample of patients with evidence of mild-to-moderate chronic venous insufficiency of the lower extremities. This study was carried out in accordance with the Declaration of Helsinki and the Principles of Good Clinical Practice. The results are set forth below:

25 **Objective** – To assess the efficacy and safety of once-daily doses of 360 and 720 mg red vine leaf extract (RVLE) compared to placebo in patients with grade I and incipient grade II chronic venous insufficiency (CVI).

30 **Design** – A 12-week, randomised, double-blind, placebo-controlled, parallel-group, multi-center study.

**Patients** – Male and female outpatients between 25 and 75 years of age with grade I and grade II CVI (i.e. without extensive trophic changes), without further significant medical

conditions and not treated with compression stockings, diuretics or other drugs affecting fluid balance.

**Intervention** – Patients were randomly assigned to a double-blind treatment with placebo, 360 mg RVLE or 720 mg RVLE once daily for 12 weeks, preceded and followed by a single-blind 2-week placebo treatment for baseline run-in and end-of-trial washout, respectively. Study criteria were evaluated at baseline, after 6 and 12 weeks of treatment and 2 weeks after discontinuation of treatment.

**Outcome Measures** – Primary outcome measure: Change in lower leg volume, as determined by water displacement plethysmography. Secondary outcome measures: Change in ankle and calf circumference; change in intensity of key symptoms (“tired, heavy legs”, “feeling of tenseness”, “tingling sensation”, and “tenderness/pain”) compared to baseline.

**Results** – Of the 260 patients enrolled and randomised, 219 completed the study in accordance with the protocol. In the intention-to-treat analysis (N = 257), the mean ( $\pm$  SD) lower leg volume of the patients treated with placebo (N = 87) increased by  $15.2 \pm 90.1$  g (displaced water mass) compared to baseline after 6 weeks of treatment and by  $33.7 \pm 96.1$  g compared to baseline after 12 weeks of treatment. In patients treated with RVLE according to this invention, however, lower leg volume decreased and, after 12 weeks of treatment, the difference in mean lower leg volume between the active treatment groups and the placebo group was  $-75.9$  g (95% CI:  $-106.1$  to  $45.8$  g) for the 360-mg RVLE group (N = 86) and  $-99.9$  g (95% CI:  $-130.3$  to  $-69.6$  g) for the 720-mg RVLE group (N = 84). The changes in calf circumference showed a similar pattern; in patients treated with RVLE, both the higher dose (720 mg) and, to a lesser extent, the lower dose (360 mg) resulted in a clear reduction in circumference over time, whereas, in patients treated with the placebo, the circumferences remained largely unchanged (95% CI of the estimated treatment effects vs. placebo after 12 weeks:  $-1.40$  to  $-0.56$  cm for 360 mg RVLE and  $-1.73$  to  $-0.88$  cm for 720 mg RVLE). The reductions in ankle circumference were qualitatively similar but quantitatively less marked.

There was a clear improvement in key CVI symptoms at 6 weeks with all treatments, but a further improvement at week 12 was seen only in the active treatment groups; at 12

weeks, the changes compared to baseline were significantly greater ( $p < 0.001$ ) in both active treatment groups than in the placebo group. The treatments were well tolerated. Adverse events were rare and usually mild. Two AEs during treatment with the placebo led to hospitalisation. Three further patients were withdrawn because of AEs which occurred during treatment with the placebo.

**Conclusion** – Once-daily doses of 360 and 720 mg RVLE appeared safe and effective in the treatment of mild CVI, reducing lower leg oedema and circumference whilst improving key CVI-related symptoms. The extent of oedema reduction is at least equivalent to that reported for compression stockings and/or other oedema-reducing agents. The higher dose was as well tolerated as the lower dose but resulted in a slightly greater and more sustained improvement.

It will be readily apparent to those skilled in the art that various changes and modifications of an obvious nature may be made without departing from the spirit of the invention, and all such changes and modifications of an obvious nature may be made without departing from the spirit of the invention, and all such changes and modifications are considered to fall within the scope of the invention, as defined by the claims as defined. While the composition of the present invention has been set forth in what is believed to be preferred embodiments, it is recognised that departures may be made within the spirit and scope of the following claims which, therefore, should not be limited except within the doctrine of equivalents.



**Claims:**

1. A method for prevention and/or treatment of the discomfort associated with mild-to-moderate chronic venous insufficiency of the lower extremities, which method comprises administering an effective amount of a dietary supplement containing an aqueous extract of red vine leaves to the a person in need thereof.
2. A method according to claim 1, wherein the dietary supplement is in a form suitable for oral administration.
3. A method according to claim 1 or 2 wherein said red vine leaf extract contains at least 2 and up to 20% flavonoids.
4. A method according to claim 3 wherein said red vine leaf extract contains at least 2 and up to 10% flavonoids.
5. A method according to any of the preceding claims wherein flavonoids are present within the range of 0.1% to 15% related to the total mass of the dietary supplement composition.
6. A method according to claim 5 wherein flavonoids are present within the range of 1% to 10% related to the total mass of the dietary supplement composition.
7. A method according to any of the preceding claims wherein said red vine leaf extract is present within the range of 1 to 90% related to the total mass of the dietary supplement composition.
8. A method according to claim 7 wherein said red vine leaf extract is present within the range of 1 to 70% related to the total mass of the dietary supplement composition.
9. A method according to claim 8 wherein said red vine leaf extract is present within the range of 1 to 50% related to the total mass of the dietary supplement composition.

10. A method according to any of the preceding claims claim 1, wherein the dietary supplement composition is in a form suitable of granules, tablets, capsules, drops or syrups for oral administration.

5 11. An improved dietary supplement composition which comprises an active principle being capable of preventing or treating the discomfort associated with mild-to-moderate chronic venous insufficiency of the lower extremities and an pharmaceutically, cosmetically or dietetically acceptable carrier, the improvement wherein is that said active principle essentially consists of an aqueous extract of red vine leaves.

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12. A dietary supplement composition according to claim 11, wherein the aqueous extract of red vine leaves is obtainable by a method comprising the steps of:

(a) collecting red vine leaves at a point of time when the content in flavonoids has reached an optimum;

15

(b) drying and crushing the leaves;

(c) cutting the leaves to pieces;

(d) extracting the leaves with water at elevated temperatures for 6 to 10 hours;

(e) optionally concentrating the obtained extract.

20

13. A dietary supplement according to claim 12, wherein the leaves in step (d) are extracted with water at temperatures from 60 to 80 °C.

14. The use of an aqueous extract of red vine leaves for the preparation of a dietary supplement for the prevention and/or treatment of the discomfort associated with mild-to-  
25 moderate chronic venous insufficiency of the lower extremities.

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/10292

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A23L1/30 A61K35/78

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A23L A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, PAJ, FSTA, MEDLINE

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 934 554 A (ABELES) claims 1-10 page 1, line 8 - line 12; example B page 2, line 4 - line 14 page 3, line 93 - line 114 examples 1-5	1-14
X	GIRRE L ET AL: "IN-VITRO ANTIHERPETIC ACTIVITY OF THE LEAVES OF THE RED VINE VITIS-VINIFERA" FITOTERAPIA., vol. 61, no. 3, 1990, pages 201-206, XP000981757 IDB HOLDING, MILAN., IT ISSN: 0367-326X page 201 -page 202	11-13

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

8 February 2001

Date of mailing of the international search report

26. 02. 2001

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/10292

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 107 000 A (LUNDER TITO L) 21 April 1992 (1992-04-21) column 1, line 46 - line 47; claims 1-5 ---	1-14
A	DATABASE MEDLINE 'Online! US NATIONAL LIBRARY OF MEDICINE (NLM), BETHESDA, MD, US; CONSTANTINI, A. ET AL.: "Clinical and capillaroscopic evaluation of chronic uncomplicated venous insufficiency with procyanidins extracted from vitis vinifera." Database accession no. 1999285428 XP002159795 abstract & MINERVA CARDIOANGIOLOGICA, vol. 47, no. 1-2, 1999, pages 39-46, EDIZIONI MINERVA MEDICA, TORINO, IT ISSN: 0026-4725 ---	1-14
A	WO 99 29331 A (INDENA SPA ;MORAZZONI PAOLO (IT); BOMBARDELLI EZIO (IT)) 17 June 1999 (1999-06-17) page 1, line 7 - line 19; claims 1-5 ---	1-14
A	EP 0 694 305 A (INDENA SPA) 31 January 1996 (1996-01-31) page 2, line 1 - line 47; claims 1,2,4 -----	1-14

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP 00/10292

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: —  
because they relate to subject matter not required to be searched by this Authority, namely:  
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

Although claims 1-10 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the composition.

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Continuation of Box I.1

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Intel. Application No

PCT/EP 00/10292

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 934554	A	NONE	
US 5107000	A	21-04-1992	
		CH 680854 A	30-11-1992
		AT 107299 T	15-07-1994
		AU 635635 B	25-03-1993
		AU 7595991 A	14-11-1991
		CA 2041934 A	10-11-1991
		DE 69102490 D	21-07-1994
		DE 69102490 T	29-09-1994
		EP 0456023 A	13-11-1991
		ES 2055485 T	16-08-1994
		IE 911451 A	20-11-1991
		IN 171738 A	26-12-1992
		JP 3042907 B	22-05-2000
		JP 5086049 A	06-04-1993
		NZ 238069 A	26-03-1992
		PT 97582 A,B	28-02-1992
		ZA 9103142 A	25-03-1992
WO 9929331	A	17-06-1999	
		IT MI972690 A	04-06-1999
		AU 1562799 A	28-06-1999
		BR 9805813 A	14-12-1999
		CN 1280498 T	17-01-2001
		EP 1035859 A	20-09-2000
		NO 20002827 A	02-06-2000
EP 0694305	A	31-01-1996	
		IT 1270999 B	26-05-1997
		AU 684963 B	08-01-1998
		AU 2718095 A	08-02-1996
		CA 2154601 A	27-01-1996
		JP 8059463 A	05-03-1996
		SG 30422 A	01-06-1996
		US 5665365 A	09-09-1997

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